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W.O.
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User Handbook
FLAME THROWER,
PORTABLE, N°5,
Mark 1.



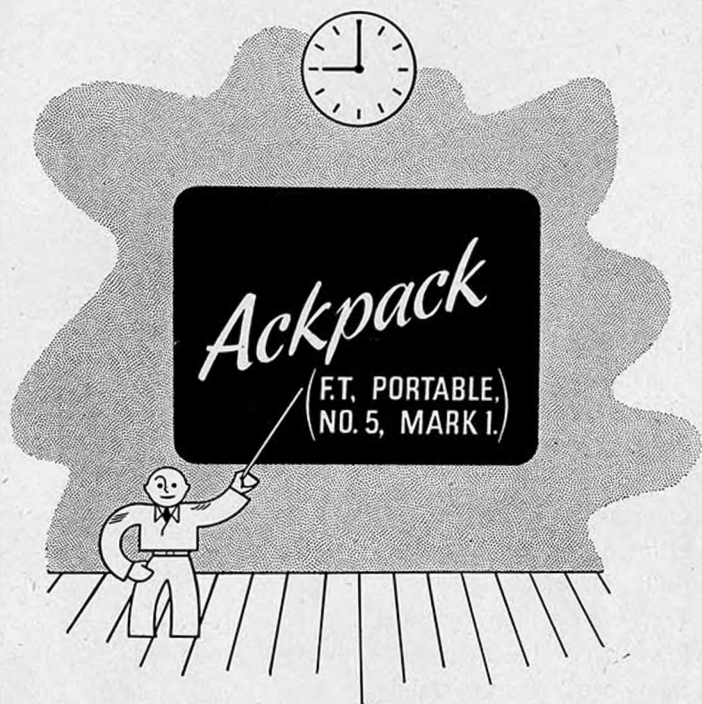
LAND SERVICE

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U S E R H A N D B O O K

NOTE:—

Attention is drawn to "The Principles and Practice of Good Instruction, Part I". This pamphlet lays down the principles and methods of instruction to be followed by all officers and N.C.O. instructors.

Contents & Index.



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DISTRIBUTION

One copy for each equipment.



1. The object of this handbook is to give all the information necessary to enable a unit equipped with Ackpack flame throwers to employ these equipments in a satisfactory manner.
2. The handbook therefore covers the following aspects:—
 - (a) Such details of the equipment and its mode of operation as are necessary to the unit.
 - (b) Information necessary to unit instructors to train operators in its use.
 - (c) The cleaning and maintenance work necessary in the unit. The amount of repair work required to be done in the unit is negligible; this problem is mentioned in para. 3.
 - (d) The provision of the necessary fuel, ignition cartridges, compressed gas, etc., in the field.
3. The Ackpack flame thrower has been specially designed to ease the problems of maintenance and repair as they affect the unit in the field. If the equipment fails to function satisfactorily in the hands of an experienced operator, it is evacuated through normal channels for repair in the appropriate R.E.M.E. workshops. It is NOT stripped, examined and repaired in the unit, and for this reason no spare parts (with one small exception) are carried.
4. To enable R.E.M.E. Workshops to repair and test equipments, two further handbooks are available:—
 - (a) The General Textbook:—This contains complete details of all components, their exact function and adjustment, and instructions for the carrying out of certain periodic tests.
 - (b) The Identification List:—A complete list of all component parts with their correct Ordnance designation and part number. This list is not required in the unit for the reason given in para. 3.

It is emphasized that these are not necessary to the "user" unit, whose requirements are fully covered by this handbook.

5. The tactical handling of the equipment is not considered in this handbook; reference is made to the appropriate sections in Military Training Pamphlet, No. 68.

6. To facilitate the training of operators in the unit, Sections 1 to 7 have been written to form the basis of seven lessons, each of which requires approximately $\frac{3}{4}$ of an hour. To preserve the correct sequence of instruction it is important not to go beyond the scope of each individual lesson, and to ensure, by question and answer at its conclusion, that each lesson is thoroughly understood before proceeding to the next.

An actual equipment should be used in all lessons for demonstration purposes, though it will be found that the function of some components require illustrating by blackboard diagrams.

7. Throughout this handbook the correct term igniter is used when referring to the igniter cartridge.



GENERAL DESCRIPTION

Section 1

8. Instructor's Note. This section is Lesson 1 and should be divided into two parts:—

- (a) The object of the first part is to demonstrate the firing of the equipment, and two Ackpacks should be used. Comments during this demonstration should be of the briefest nature.
- (b) The object of the second part of the lesson is to give a general description of the equipment, in which no attempt should be made to go into the detail given in later sections. The information required for this general description is given in paras. 9 to 13.

9. Data

- (a) Weight ... Empty 17½ lb.
Full 48 lb.
- (b) Range ... Maximum effective range approximately 50 yards.
- (c) Firing time ... A total of 10 secs. with one fill (i.e., five 2-sec. shots, or ten 1-sec. shots).

10. Four main components. (See Fig. 1.)

- (a) Waist-belt and braces.
- (b) Fuel container.
- (c) Gas container.
- (d) Projector.

11. Mode of Operation.

- (a) Two operations are necessary to produce a shot of burning fuel:—
 - (i) Projection of the fuel.
 - (ii) Ignition of the fuel.
- (b) To accomplish this, three systems are required.

12. The three systems. (These are described in detail in Secs. 2 to 4.)

- (a) Fuel system. Fuel is stored in the fuel container from which it flows through a fuel hose into the projector, where it is held by a valve, ready for emission.
- (b) Pressure system. Gas is stored in the gas container and, when released, passes to the top of the fuel which is then under pressure.
- (c) Ignition system. Ignition of the fuel is obtained by the firing of an igniter located at the nozzle of the projector. This is timed to occur before the fuel under pressure is released.

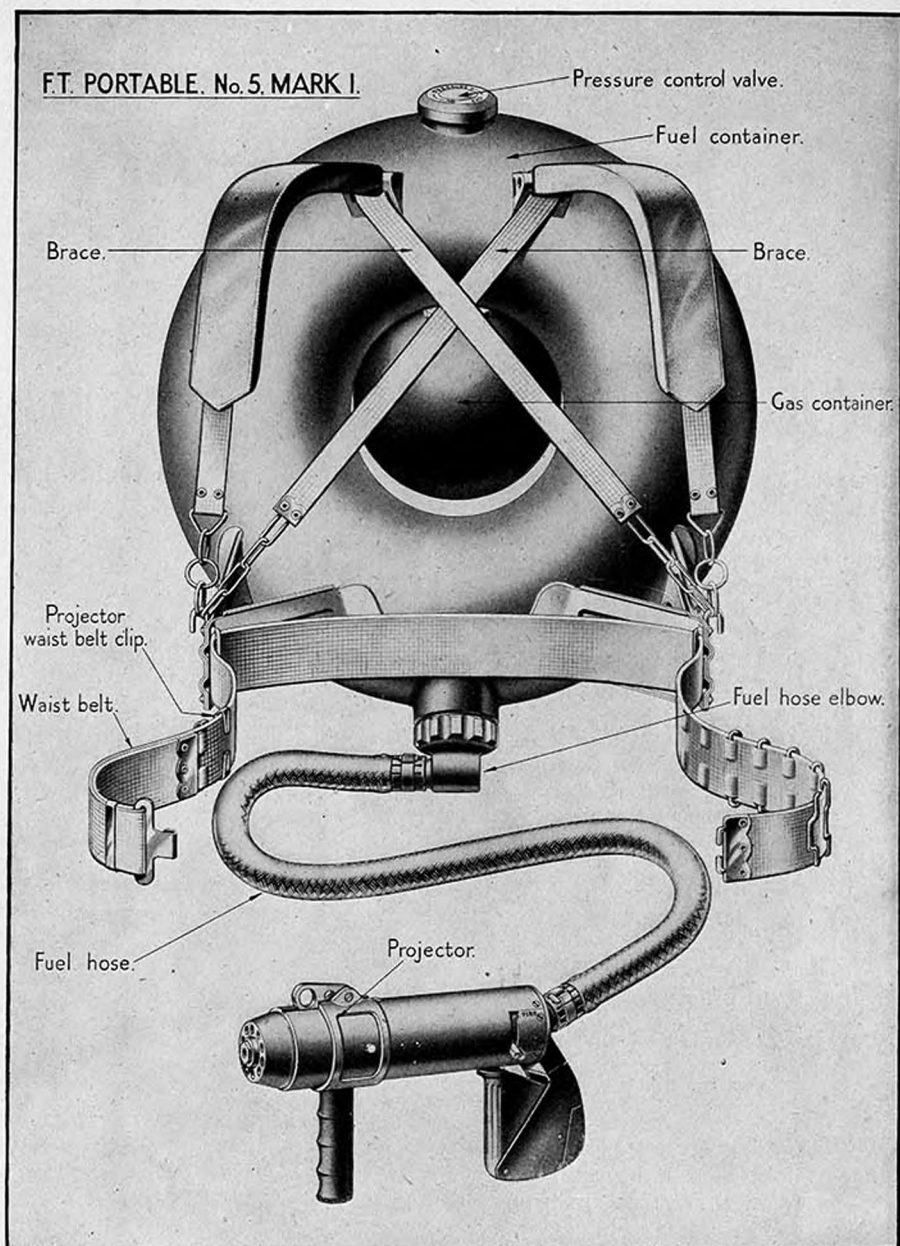


Fig. 1.

13. Firing controls. To enable these systems to operate when required there are two controls—TRIGGER and SAFETY CATCH SLEEVE.

- (a) Pressure of the trigger causes firing of an igniter followed by release of the fuel under pressure. The rod of fuel is ignited by the burning igniter, thus producing a flame shot.
- (b) Only the correct pressing of the trigger will ensure a flame shot.
- (c) The safety catch sleeve prevents movement of the trigger until it is set at FIRE.



THE FUEL SYSTEM

Section 2

14. INSTRUCTOR'S NOTE. This section is Lesson 2 and has as its object the complete description of the fuel system. In addition to the equipment, a drum of the appropriate type of fuel should be available for demonstration purposes.

15. Fuel

- (a) The flame thrown consists of burning fuel.
- (b) The fuel which is used is specially thickened to give long range and long burning time.
- (c) There are two types for use in the Ackpack:—
 - (i) FTF Light No. 2 for use in temperate climates. Drums have their upper halves painted yellow and lower halves red.
 - (ii) FTF Heavy No. 1 for use in tropical climates. Drums have their upper halves black and lower halves green.
- (d) Fuel is supplied in 8-gallon drums.

16. Main components.

There are six main components in the fuel system:—

- (a) Fuel container.
- (b) Fuel hose.
- (c) Projector barrel (Fig. 2).
- (d) Nozzle (Fig. 2).
- (e) Pintle valve (Fig. 2).
- (f) Trigger (Fig. 2).

17. Flow of fuel

- (a) Fuel flows from the fuel container along the fuel hose to the projector barrel where it is held by the pintle valve.
- (b) This valve is opened by pressing the trigger, when fuel is emitted from the projector through the nozzle.

18. Detail of main components

- (a) Fuel container
 - (i) Lifebuoy shape.
 - (ii) Capacity 4 gals.
 - (iii) Fitted internally with tube at upper end to house pressure control valve. (Para. 24 (b).)
 - (iv) Filled by unscrewing fuel elbow nut and removing projector group, i.e., fuel elbow, fuel hose, and projector.
 - (v) Fitted at lower end with adapter which is retained by two set screws and which houses a seal.

DIAGRAMMATIC SECTION OF THE PROJECTOR BARREL

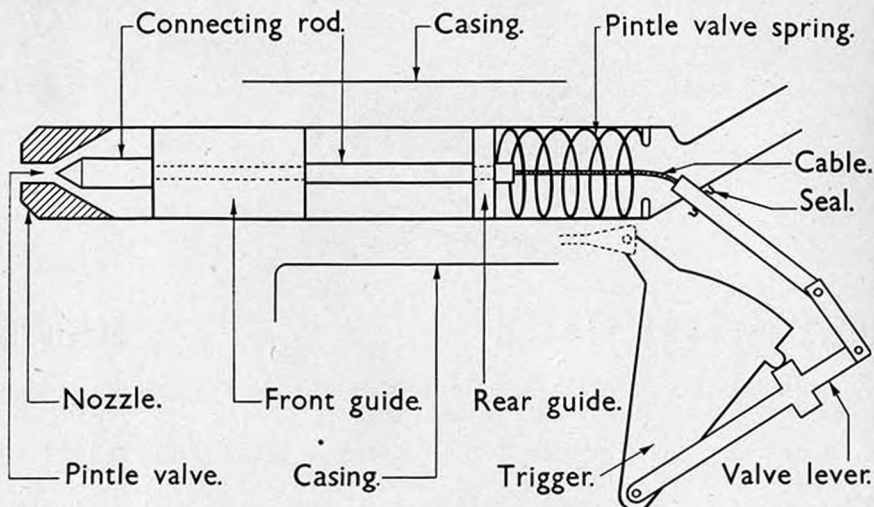


Fig. 2.

(b) Fuel hose (Fig. 3)

- (i) Fitted at one end to nipple on fuel hose elbow, at the other end to the barrel at the hose connection.
- (ii) The hose is detachable at both ends and is held in position by means of two Hayden clips. These clips are fitted by a special tool which is held by R.E.M.E. only. IN EMERGENCY, however, the unit may use a suitable Jubilee clip, but these must be replaced by Hayden clips as soon as circumstances permit.
- (iii) The fuel hose elbow enables equipment to be handled satisfactorily by left-handed or right-handed operators. Inside the fuel hose elbow is a sump to ensure complete emptying of fuel from container.

(c) Projector barrel (See Fig. 2)

- (i) Contains guides for location of pintle assembly which also act as rectifying vanes to ensure streamlined flow of fuel.

(d) Nozzle (See Fig. 2)

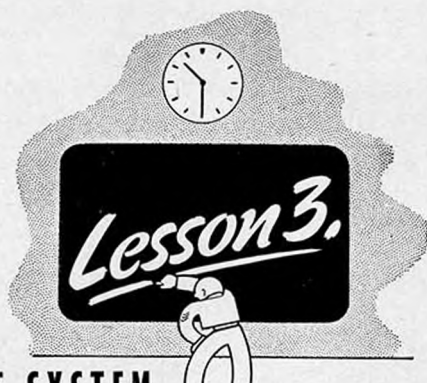
- (i) Screwed into front of barrel.
- (ii) Inner part provides perfect seating for pintle valve.

(e) Pintle valve (See Fig. 2)

- (i) Cone shaped to suit nozzle.
- (ii) Connected to trigger by connecting rods, control cable, and valve lever.
- (iii) Return spring.

(f) Trigger (See Fig. 2)

- (i) Cannot be pressed until safety catch sleeve is at FIRE.
- (ii) When pressed, it bears on valve lever, which draws back control cable, thus opening the pintle valve.
- (iii) When released, the return spring reasserts itself and forces the pintle valve on to its seat to cut off the fuel.



THE PRESSURE SYSTEM

Section 3

19. INSTRUCTOR'S NOTE. This section is Lesson 3 and has as its object the complete description of the pressure system.

20. General. Fuel is forced out of the projector by gas pressure, and inert gas is used for this purpose.

21. Inert Gas. This is the standard compressed gas for use in all flame throwers. It is made by removing the oxygen from air by burning oil, in a special plant, and its composition is roughly as follows:—

Nitrogen	...	...	86 per cent.
Carbon dioxide	...	...	14 per cent.

22. Main components (See Fig. 1)

- (a) Gas container.
- (b) Pressure control valve.
- (c) Control valve adjusting cap.

23. Flow of pressure

- (a) When the gas container is fitted, gas flows automatically to the pressure control valve, where pressure is reduced.
- (b) When the control valve adjusting cap is turned to the ON position, gas flows into the fuel container and builds up pressure on top of the fuel.

24. Detail of main components

- (a) Gas container (Figs. 1 and 3)
 - (i) Contains gas at 2,000 lb. per sq. in. pressure.
 - (ii) Capacity sufficient to discharge one fill of fuel.
 - (iii) Fitted with adapter containing Schrader valve (see Fig. 3) which screws into base of pressure control valve.
 - (iv) Schrader valve opens automatically when gas container is fitted, and allows gas to flow into pressure control valve.
 - (v) Seal to prevent the gas escaping when the gas container is fitted.
- (b) Pressure control valve (Fig. 3)
 - (i) Reduces gas pressure from 2,000 to 200 lb. per sq. in.
 - (ii) Incorporates relief valve which comes into operation when pressure on low pressure side exceeds 240 lb. per sq. in.
 - (iii) Entirely automatic and must NOT be dismantled.
- (c) Control valve adjusting cap (Fig. 3)
 - (i) Two settings—ON and OFF.
 - (ii) Must always be turned fully to required position.
 - (iii) When set at ON, gas is allowed to flow into fuel container.
 - (iv) When set at OFF, gas is prevented from entering fuel container.

PACK. (WITHOUT PROJECTOR.)

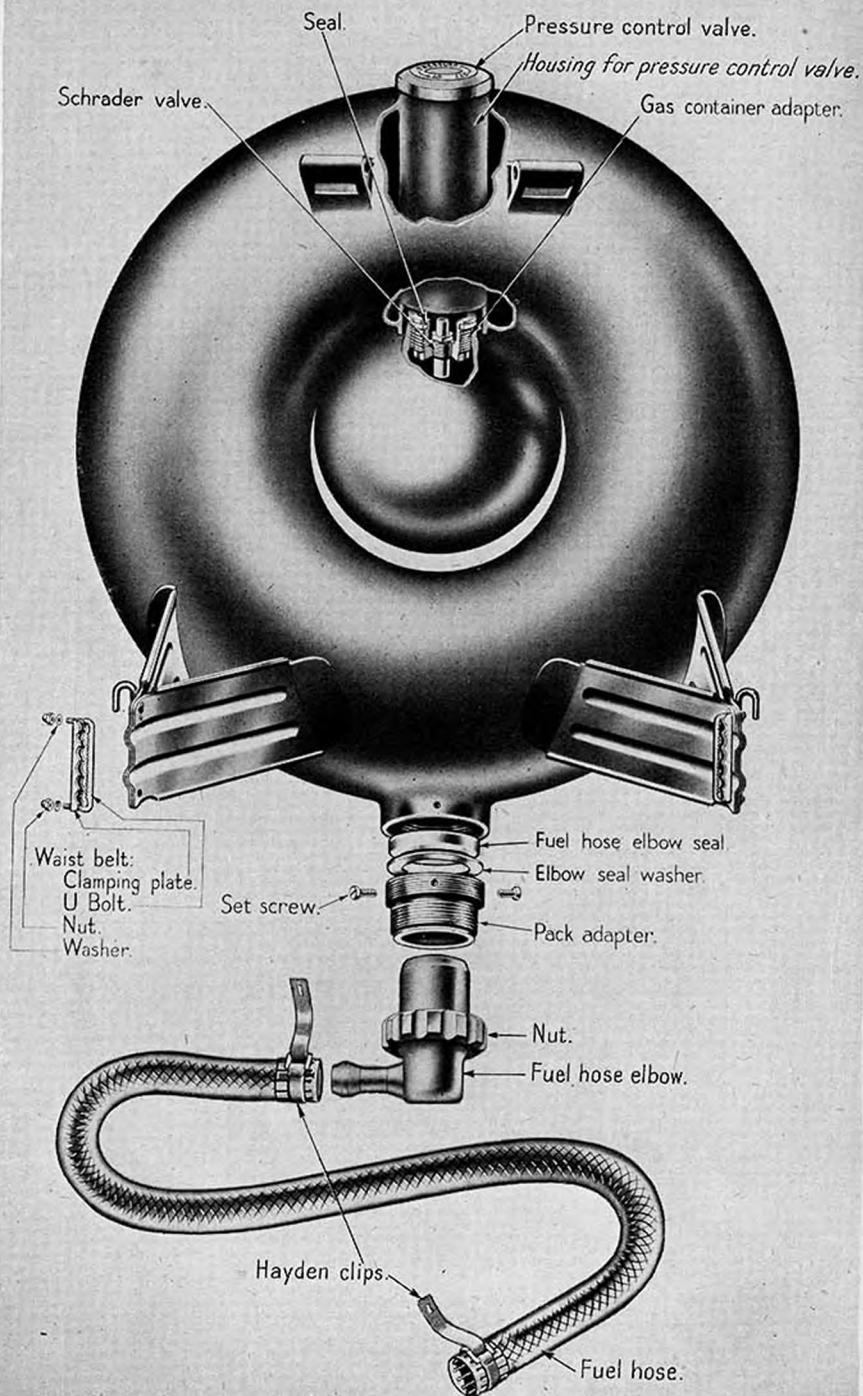


Fig. 3.



THE IGNITION SYSTEM

Section 4

25. INSTRUCTOR'S NOTE. This section is Lesson 4 and has as its object the complete description of the ignition system. For this lesson the projector casing should be removed to enable the class to see the components of the system.

26. General

- (a) To produce flame it is necessary to ignite the fuel.
- (b) This is achieved by the firing of an igniter located at the front of the projector (see Fig. 5).

27. Main components (see Figs. 4 and 5)

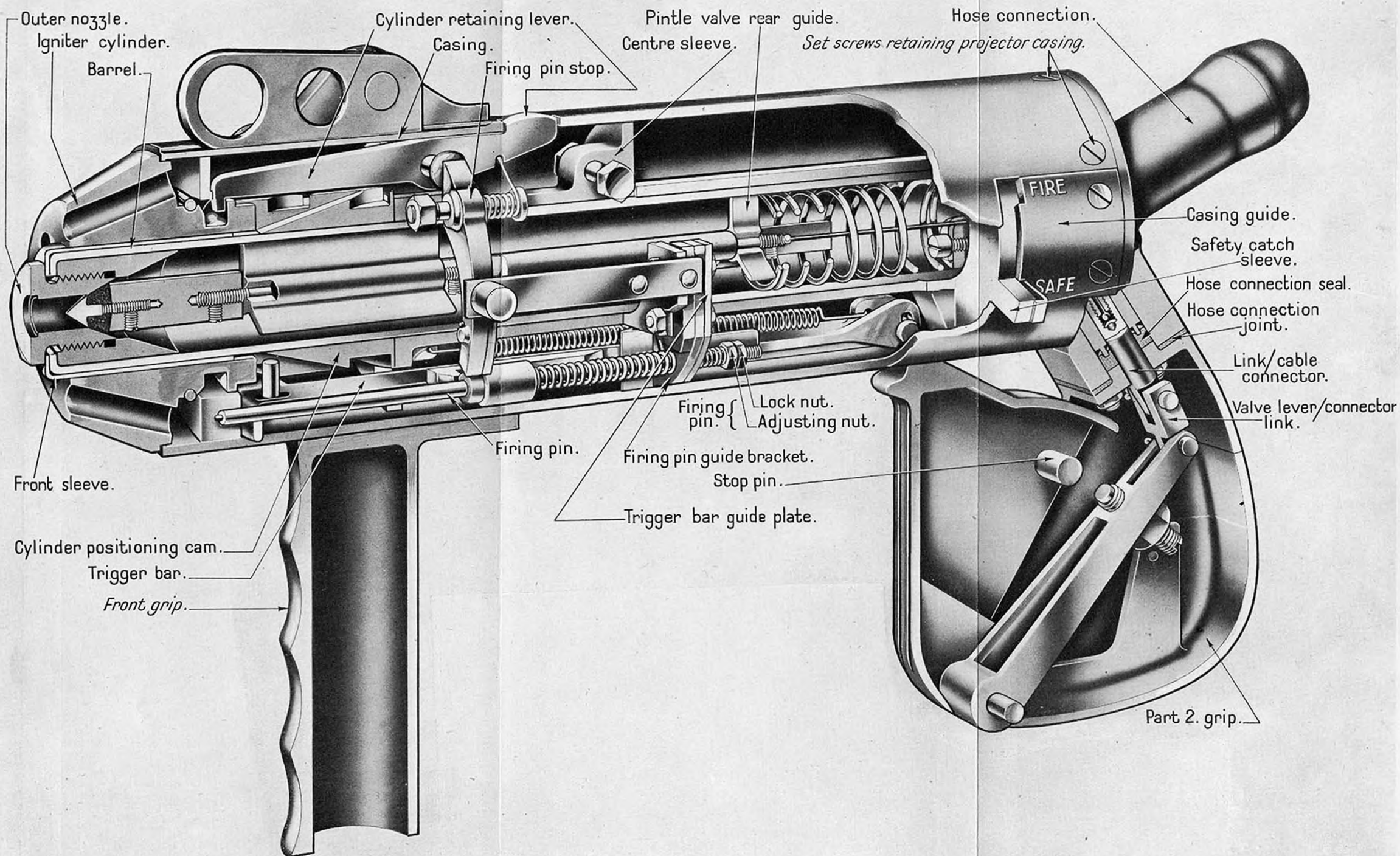
- (a) Trigger.
- (b) Trigger bar.
- (c) Firing pin.
- (d) Cylinder positioning cam.
- (e) Igniter cylinder.

28. Mode of operation

- (a) When the trigger is pressed:—
 - (i) The trigger bar is drawn to the rear, allowing the firing pin to go forward and strike an igniter, thus igniting it;
 - (ii) The pintle valve is withdrawn, thus releasing a rod of fuel which is ignited by the burning igniter as it leaves the nozzle.
- (b) When the trigger is released:—
 - (i) The pintle valve closes, thus stopping the flow of fuel;
 - (ii) The trigger bar causes the cylinder positioning cam to rotate. This rotates the igniter cylinder and brings a fresh igniter opposite the firing pin.

29. Detail of main components (see Figs. 4 and 5)

- (a) Trigger
 - (i) Object. To actuate trigger bar and pintle valve.
 - (ii) Secured at its upper end to rear of trigger bar.
- (b) Trigger bar
 - (i) Object.
 1. When trigger is pulled actuates firing pin.
 2. When trigger is released rotates the cylinder positioning cam.
 - (ii) Consists of—catch, spring and peg.
- (c) Firing pin
 - (i) Object. When actuated, strikes igniter and causes ignition.
 - (ii) Consists of—striker, rod, main spring, guide bracket and return spring.



PROJECTOR.

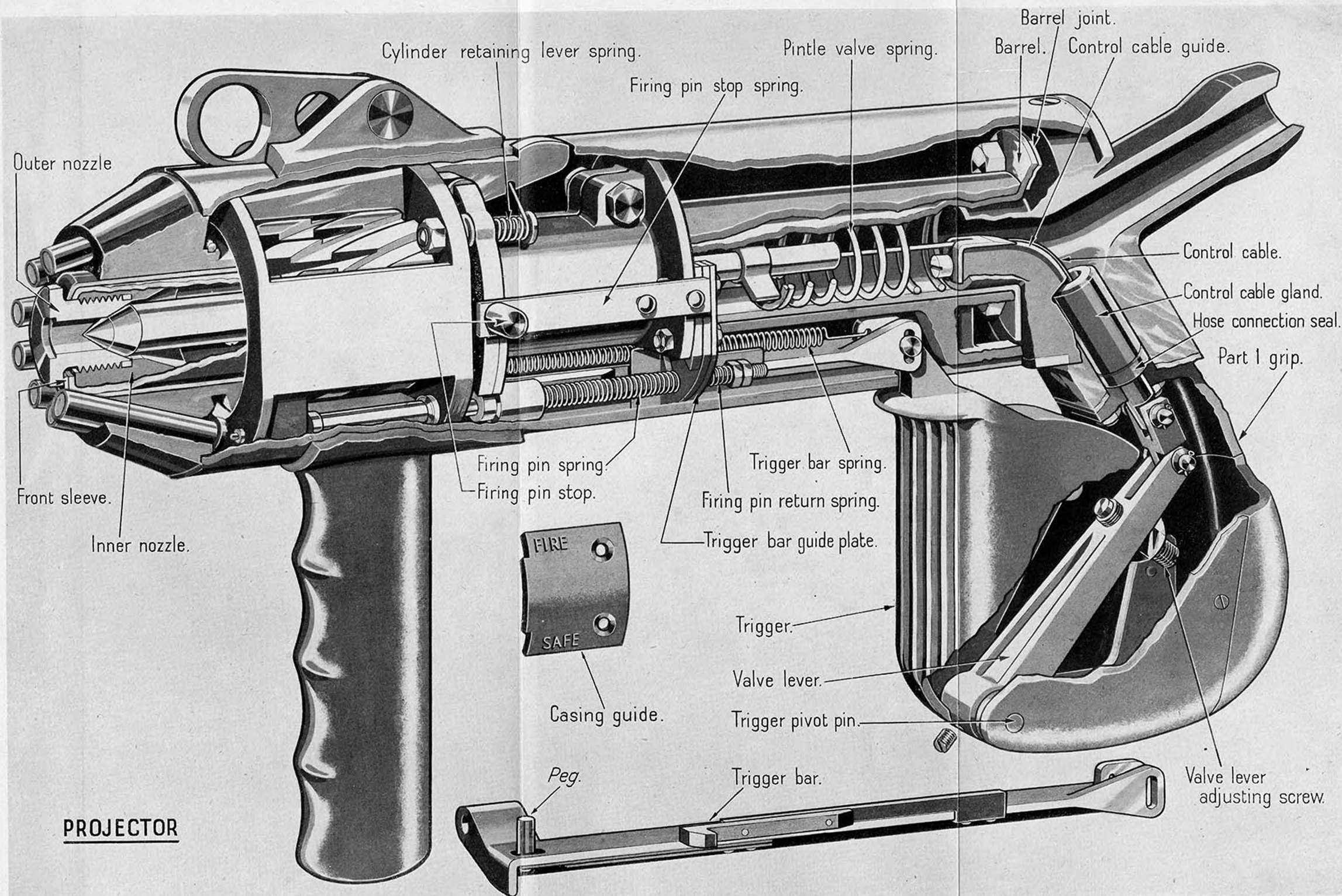


Fig. 5

(d) Cylinder positioning cam (see Fig. 6)

- (i) Object. To rotate igniter cylinder thus bringing a fresh igniter opposite the firing pin.
- (ii) Consists of—cylinder cut with ten straight and ten oblique grooves.
- (iii) Each groove is engaged successively by the peg of the trigger bar.

ACTION OF THE CYLINDER POSITIONING CAM**LOOKING FROM THE FRONT****1.**

Trigger bar commences to move to the rear. The peg on it is riding in the first longitudinal cam groove 1.

2.

The end of the rearward movement of the trigger bar. The peg leaves the longitudinal cam groove 1, and has entered the oblique groove.

3.

After firing, the trigger bar moves forward under action of its spring. The peg riding in oblique groove, rotates the positioning cam 36 degrees and so into groove 2.

4.

The igniter cylinder being engaged in the positioning cam by the bosses A and B is therefore rotated with it, thus bringing the next igniter coincident with the firing pin.

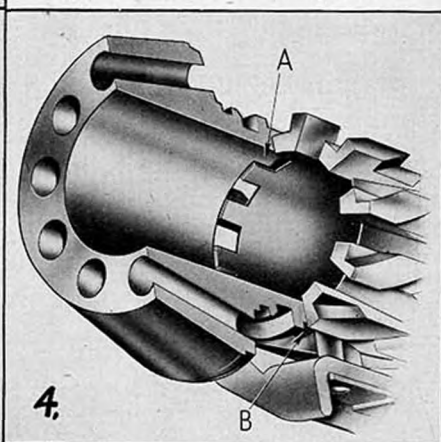
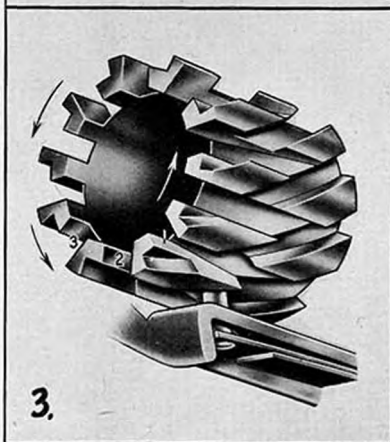
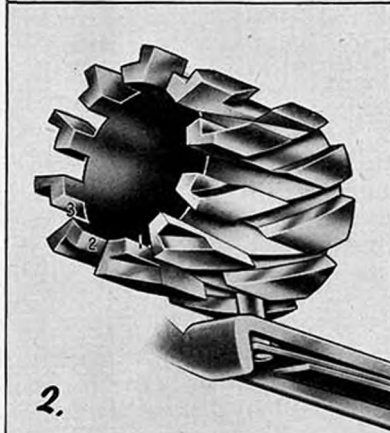
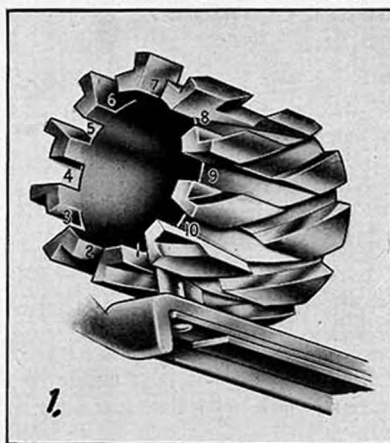


Fig. 6.

- (e) Igniter cylinder
 - (i) Object. To hold ten igniters.
 - (ii) Consists of—ten igniter chambers, each containing a magnesium igniter which will burn for approximately two seconds.
 - (iii) Located at front of projector.
 - (iv) Held in position by lip on cylinder retaining lever which engages flange on inner end of igniter cylinder.
- (f) Cylinder retaining lever
 - (i) Object. To retain igniter cylinder.
 - (ii) Consists of—lever, push button and spring.
 - (iii) Operation. Operated by push button on top of the projector, which must be pressed in order to fit or remove igniter cylinder.

30. Trigger mechanism (see Figs. 4, 5 and 6)

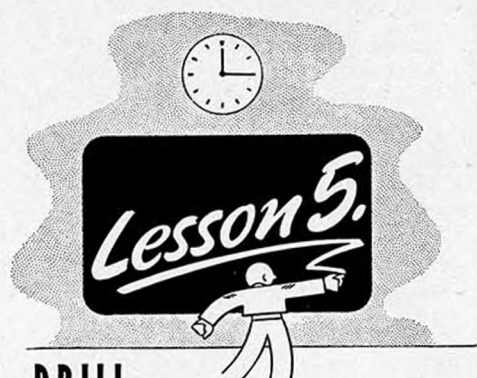
- (a) On pressing the trigger
 - (i) The trigger bar is drawn to the rear. The catch engages shoulder of firing pin and pulls it to the rear, compressing the main spring. The catch is tripped by toe on guide bracket, and main spring reasserts itself, forcing the striker on to igniter and igniting it. The return spring then withdraws striker from igniter.
 - (ii) The trigger bar peg rides back in a straight groove and no movement of the cylinder positioning cam takes place.
 - (iii) The pintle valve opens as explained in paras. 14 to 18.
- (b) On releasing the trigger
 - (i) The pintle valve closes.
 - (ii) The trigger bar peg rides forward in an oblique groove of the cylinder positioning cam and causes the cam to rotate. This in turn causes the igniter cylinder to rotate and positions a fresh igniter in front of the firing pin.

NOTE:—These actions will only occur if the trigger is handled correctly (para. 37).

31. Safety catch sleeve is capable of being rotated from the SAFE to the FIRE position and vice versa. It is formed with a thumb piece for this purpose and is so shaped that, when turned to the SAFE position, the trigger is prevented from being actuated. A casing guide at the rear end of the projector is engraved with the words SAFE and FIRE.

32. Firing pin stop (see Fig. 5)

- (a) Object. To enable equipment to fire unignited shots.
- (b) Consists of—spring-loaded pin on left of projector casing.
- (c) Operation. Stop engages in front shoulder of firing pin as it moves forward and prevents it striking igniter.



OPERATIONAL DRILL

Section 5

33. INSTRUCTOR'S NOTE. This section is Lesson 5 and has as its object the instruction of operators in firing procedure. It is essentially an outdoor period and should be carried out on a range, first as a demonstration, then followed by individual practice under supervision.

34. Fuelling

- (a) Before fuelling, blow down as follows:—
- (i) Set safety catch sleeve at SAFE.
 - (ii) Remove igniter cylinder.
 - (iii) Set safety catch sleeve at FIRE.
 - (iv) Point projector to ground and press trigger, thus releasing all remaining fuel and gas from equipment. Do not point projector towards burning fuel on the ground.
 - (v) Set safety catch sleeve at SAFE.
 - (vi) Turn control valve adjusting cap to OFF position.

(b) To fit the gas container:—

- (i) Ensure that the gas container issued is full (para. 64 (c)).
- (ii) Unscrew protecting cap and place in individual box.
- (iii) Screw gas container into pressure control valve hand tight.

NOTE:—Care should be taken to see that the threads are not crossed when the gas container is being fitted, as damage may be caused to the control valve.

(c) To fill the fuel container:—

- (i) This should be done by two men to prevent damage to the control valve adjusting cap.
- (ii) Proceed as follows:—
 1. Invert fuel container and rest it on feet of operator so that control valve adjusting cap is raised from the ground.
 2. Remove fuel elbow, and projector group.
 3. Fill with 4 gals. of fuel.
 4. Ensure that fuel elbow seal is free from grit.
 5. Replace fuel elbow and projector group, screwing up nut finger tight.

35. To prepare for action:—

- (a) Put on equipment and adjust belt and braces for comfort.
- (b) Check safety catch sleeve at SAFE.
- (c) Fit igniter cylinder.
- (d) Turn control valve adjusting cap to ON position.

36. To fire:—

- (a) Set safety catch sleeve at FIRE.
- (b) Press trigger sharply, ensuring that it moves to full length of travel.
- (c) Keep the projector still; do not use "hose-pipe" method.

NOTE:—Operators must be taught to watch their target, and on no account to allow their eyes to wander to the projector while firing, otherwise they will be blinded, temporarily at least, and unable to observe subsequent shots.

This point is particularly important:—

- A. When firing in the prone position, when the projector is necessarily much nearer the eyes.
- B. At night.

37. To stop firing:—

Release trigger quickly and fully.

NOTE:—Misfires will result if the trigger is not handled correctly.

38. To fire an unignited shot:—

- (a) Depress firing pin stop (see Fig. 5) on left side of projector casing.
- (b) Press trigger.
- (c) Release trigger.
- (d) Release firing pin stop.

39. After firing:—

- (a) Blow down (para. 34 (a)) at the earliest opportunity.
- (b) Remove gas container.
- (c) Replace the protective caps on the equipment and gas container.
- (d) Replace gas container in its individual box.
- (e) Clean the equipment (para. 44) paying particular attention to fuel deposits.

NOTE:—It is important that the gas container should not remain on the equipment for any length of time to avoid damage to the valve. Therefore the drill shown in para. 39 should be carried out as soon as possible after firing.

40. Misfires

- (a) These should not normally occur, but may do in the following circumstances:—
 - (i) If the trigger is not fully released after firing a shot. This prevents the trigger from resuming its normal position, and consequently the igniter cylinder is not fully rotated. The result will be that a fired igniter is again struck or a fresh igniter is not opposite the firing pin.
 - (ii) In the case of a faulty igniter. The trigger should be pressed again after fully releasing it, thus bringing a fresh igniter into position.
- (b) If misfires are persistent, the equipment should be handed in for examination by R.E.M.E.

41. General

- (a) Always point the projector away from the body and downwards except when actually firing.
- (b) Do not let the projector fall to the ground when putting on the equipment, otherwise dirt may get into the working parts. To obviate this, a hook is attached to the waist belt for the projector to be attached to when not in use.



MAINTENANCE, CARE AND STORAGE

Section 6

42. INSTRUCTOR'S NOTE. This section is Lesson 6 and has as its object to teach operators to look after the equipments entrusted to them: all the points (except para. 47) should be brought out by demonstration, and this should later be followed by practice by the individual operators.

MAINTENANCE

43. General

- (a) Maintenance of the equipment consists of cleaning, inspection and lubrication.
- (b) With the exception of replacing the seal elbow (see Fig. 3), and the removal of the projector casing for the purpose of lubricating, all stripping, assembling and adjustments will be carried out by R.E.M.E. The replacement of the seal elbow will be carried out by the *unit armourer*, and for this reason para. 47 below will NOT be taught to the operator.
- (c) All defects and damage are to be reported immediately in order that unserviceable parts may be repaired or replaced by R.E.M.E.

44. Cleaning

- (a) All dirt, mud and moisture must be removed from metal surfaces using a cloth soaked in DERV to prevent rust: the minimum quantity of DERV must be used as any residue will attract dust.
- (b) Any mud on the hose should be allowed to dry and then be brushed off.
- (c) Harness should be cleaned in the usual way.

45. Inspection

Inspect the equipment in the following sequence:—

- | | |
|--------------------|---|
| (a) Fuel container | <ul style="list-style-type: none"> (i) Waist belt and braces. Check fit. (ii) Staples. (iii) Control valve adjusting cap. (iv) Fuel elbow seal. |
| (b) Fuel hose | <ul style="list-style-type: none"> (i) Clips. (ii) No kinks. |
| (c) Projector | <ul style="list-style-type: none"> (i) Safety catch sleeve. (ii) Trigger. (iii) Igniter retaining lever. (iv) Firing pin stop. |

46. Lubrication

(a) General

- (i) In order that the equipment may operate and be manipulated with normal ease, all working surfaces and mechanisms should be correctly lubricated.
- (ii) The principal part requiring attention is the projector, which should be lubricated with C70 or M80 oil.
- (iii) Fresh lubricant is not to be applied until the old lubricant has been removed by a petrol moistened rag.
- (iv) Over-lubrication is to be avoided and any surplus oil must be wiped off at once in order to prevent accumulation of dust and grit.
- (v) When lubrication has been completed, the mechanism should be operated in order to ensure even distribution of the oil.

(b) Removal of projector casing

Remove the projector casing as follows (see Fig. 4):—

- (i) Depress cylinder retaining lever and remove igniter cylinder, if fitted.
- (ii) Remove five set screws securing the casing.
- (iii) Depress cylinder retaining lever and withdraw the casing.

(c) Lubrication of projector (see Fig. 7)

Lubricate the projector in the following sequence:—

- (i) Firing pin at all positions where it moves in centre sleeve.
- (ii) Firing pin guide bracket where it trips the trigger bar and where firing pin is located through it.
- (iii) Trigger bar at peg and springs on the front end: at the catch which trips lower end of firing pin guide bracket: at the pin securing the bar to upper end of trigger.
- (iv) Trigger at the trigger pivot pin.
- (v) Cylinder retaining lever with its pivot pin and spring.
- (vi) Firing pin stop and its axis pin.
- (vii) Front sleeve at the surface against which the igniter cylinder bears.
- (viii) Cylinder positioning cam at the grooves.

(d) Flushing of equipment

After the equipment has been filled and fired five times, it is necessary to flush out the whole equipment with petrol to clear any old fuel. The fuel container should be filled with petrol and emptied in the same manner as for firing (para. 36) *EXCEPT that the igniter cylinder is removed.*

47. Changing of a seal elbow (para. 43 (b) and Fig. 3)

The seal elbow (Part No. MI/MR6833) is changed by the unit armorer when a leak occurs at the fuel elbow (see Fault Finding Table, Sec. 7) as follows:—

- (a) Ease off two set screws retaining the seal.
- (b) Unscrew adapter, withdraw elbow seat washer and then the seal.
- (c) Examine new seal and ensure that it is clean and perfectly smooth, and not perished or damaged in any way.
- (d) Smear new seal with a light film of lubricating oil, and insert it with the cup facing fuel container.
- (e) Replace elbow seat washer, screw home adapter, and tighten set screws.

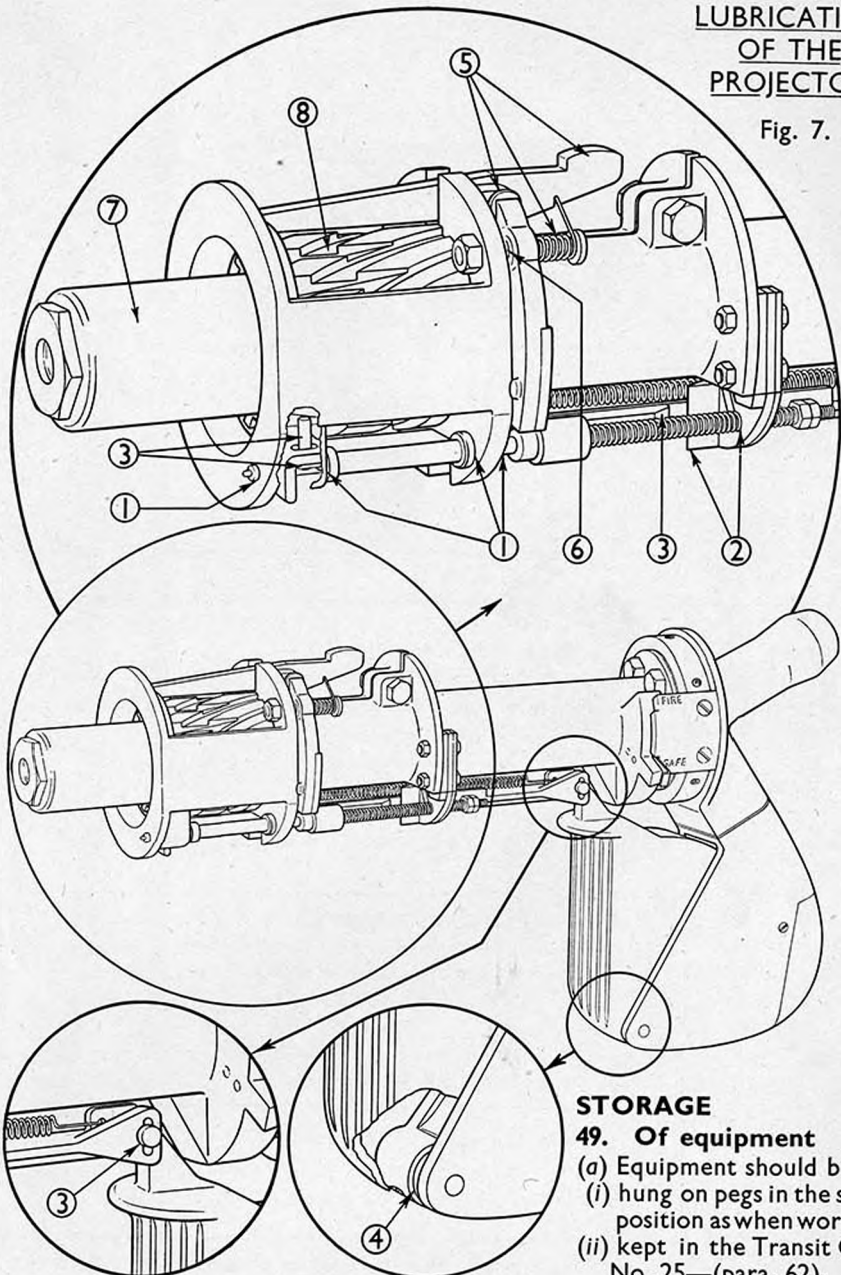
CARE

48. The following are important

- (a) Careful handling is essential at all times. Do not drop the equipment on the ground.
- (b) Do not trail the projector on the ground.
- (c) Avoid kinking fuel hose.

LUBRICATION OF THE PROJECTOR.

Fig. 7.



STORAGE

49. Of equipment

- (a) Equipment should be
 - (i) hung on pegs in the same position as when worn, or
 - (ii) kept in the Transit Case No. 25—(para. 62).

- (b) Fuel hose should not be strained or restricted. Store it so that it is as nearly as possible straight. If it is stored in a bent position, it will perish and fuel leaks will result.
- (c) Equipment must not be stored with either fuel or gas in the container.

50. Of fuel

- (a) FTF is inflammable and should be stored with the same precautions as other inflammable materials, e.g., petrol.
- (b) Fuel drums must be stored on their sides to prevent entry of water and subsequent deterioration of the fuel.



FAULT FINDING

Section 7

FAULT FINDING TABLE

	I	
SYSTEM	FAULT	
FUEL	1. Dribble of fuel from front of projector	
	2. Squeezing trigger does not open pintle valve properly	
	3. Leak of fuel on to trigger	
	4. Leak of fuel at fuel hose elbow	
	5. Damaged or leaking fuel hose	
PRESSURE	1. Short range	
	2. Leak of pressure from base of pressure control valve	
	3. Relief valve blowing	
IGNITION	1. Misfire	

51. INSTRUCTOR'S NOTE. This section is Lesson 7 and its object is to teach the faults that may occur in the equipment, and their remedy.

Since at this stage of the instruction the operators should understand the workings of each system, the question and answer method should be used to extract the causes of the faults.

52. The following table sets out the faults which may occur on the Ackpack by systems in order of probability.

As indicated in the table these faults are dealt with by:—

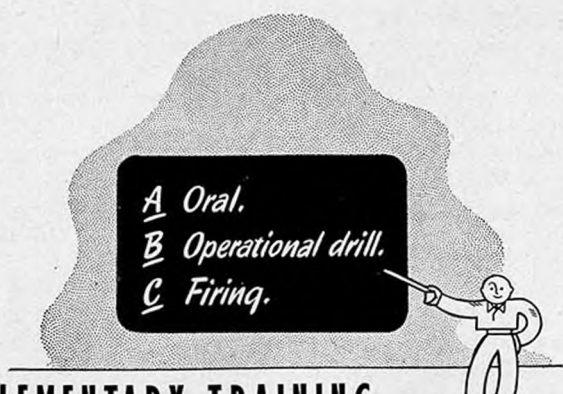
- The operator: simple faults, not involving any stripping or replacement of parts, as shown in cols. 1, 2 and 3.
- The unit armourer: for action to be taken in the case of the only fault which comes into this category (col. 4), see para. 47.
- R.E.M.E. workshops: all faults involving stripping or the replacement of parts (except (b) above) come into this category.

53. The action to be taken under the heading "Units Action" will not be taught to operators.

54. It must be stressed that in the event of there being no operator's action, the latter must report the fault, and not tamper with the equipment.

NOTE: The term R.E.M.E. used in col. 4 indicates that the equipment should be evacuated through normal channels to the appropriate R.E.M.E. workshops.

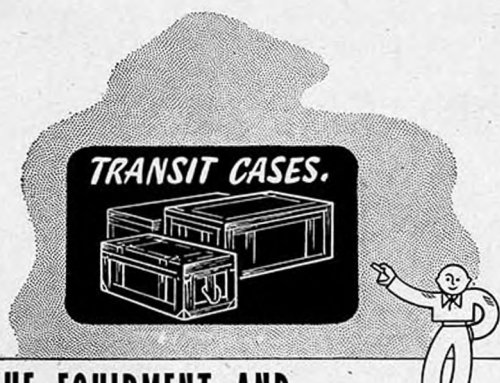
2	3	4
CAUSE	ACTION BY OPERATOR	ACTION BY UNIT
1. Hardened fuel or dirt on seating 2. Damaged pintle valve or nozzle assembly 3. Faulty return spring	Clean Report Report	— R.E.M.E. R.E.M.E.
1. Strained cable 2. Broken cable	Report Report	R.E.M.E. R.E.M.E.
1. Worn or damaged gland	Report	R.E.M.E.
1. Worn or damaged seal	Report	Seal renewed by unit armourer
1. Worn or damaged hose	Report	R.E.M.E.
1. Lack of pressure in gas container 2. Incorrect setting of pressure control valve	Change gas container Report	— R.E.M.E.
1. Worn or damaged seal 2. Incorrectly set	Report Report	R.E.M.E. R.E.M.E.
1. Incorrect handling of trigger 2. Faulty igniter 3. Lack of lubrication 4. Dirty or damaged firing pin 5. Damaged firing mechanism 6. Dirty sleeve of igniter cylinder	Handle correctly Pull trigger Lubricate Clean or report Report Clean	— — — R.E.M.E. R.E.M.E. —



TESTS OF ELEMENTARY TRAINING

Section 8

55. At the end of the man's initial training, in accordance with Secs. 1 to 7, his efficiency as an operator must be tested.
56. The tests should be carried out periodically, particularly if the equipment has not been in use for any length of time.
57. The results of the tests will be a guide to requirements for further training.
58. The following tests are suggested:—
- Oral test.
 - Operational drill.
 - Firing.
59. **Oral Test**
- Ask the man four questions framed so as to require more than a "Yes" or "No" answer.
 - Qualifying standard—three out of the four questions must be answered correctly.
60. **Operational drill**
- Test the man in his ability to carry out operational drill.
 - Qualifying standard—all actions to be carried out correctly in right sequence.
61. **Firing**
- Site four targets, one at 15, one at 25, one at 35 and one at 45 yards range. Test the man in his ability to fire accurately.
 - Qualifying standard—each target to be hit once.



PROVISION OF THE EQUIPMENT AND ACCESSORIES IN THE FIELD

Section 9

62. The equipment

The complete equipment is carried in the Transit Case, No. 25, which is specially designed to prevent damage when the equipment is in transit: where possible it should also be kept in this case when not actually in use. Data on the Transit Case, No. 25 is as follows:—

Dimensions	...	...	...	...	13 in. x 32.75 in. x 26.75 in.
Weight full (with one equipment)	...	...	...	...	88 lb
Weight empty	...	...	...	...	70 lb.

63. Gas containers

These are provided on the scale of 10 for each equipment and weigh $2\frac{3}{4}$ lb. each.

Case, Transit, No. 26 holds ten boxes each of which holds one gas container. These boxes must always be used with the No. 26 case, when the case is required, as it is incomplete without them. However, the individual boxes can be used alone thus obviating the use of the No. 26 case when small numbers (less than 10) of gas containers are involved.

Data

Case, Transit No. 26.

Dimensions	...	...	...	...	50 in. x 22in. x 14 in.
Weight, full (with 10 gas containers in individual boxes)	...	...	...	...	140 lb.
Weight, empty (without gas containers and individual boxes)	...	...	...	...	65 lb.

Individual Boxes.

Dimensions	...	...	...	...	8.5 in. x 8.5 in. x 10.5 in.
Weight, full	...	...	...	...	7.5 lb.
Weight, empty	...	...	...	...	4.75 lb.

64. Recharging of gas containers

- (a) The provision of charged gas containers is the responsibility of the R.A.O.C.

- (b) They are charged under R.E.M.E. arrangements using an apparatus called a gas charger which ensures the correct pressure of 2,000 lb. per sq. inch.
- (c) Great care must be taken within the unit to distinguish between charged and empty gas containers. Charged containers will arrive in the unit packed ten in a Case, Transit, No. 26, each container being in an individual box which will be *sealed with wire*. Empty gas containers being returned for recharging will be packed in a Case, Transit, No. 26, or loose, in the individual box. The individual box will NOT be sealed in these circumstances. This is the means of differentiating between full and empty gas containers.

65. Apparatus, Pressure Testing, Gas Container, No. 2, Mark I

The Apparatus, Pressure Testing, Gas Container, No. 2, Mark I is a special gauge intended to check the pressure in each gas container. This checking should be done by the unit on receipt from the R.A.O.C., but should be so arranged that there is a minimum period of time between actual checking and the use of the gas container. The testing apparatus is carried in a special box, and is to be issued on the scale of one for every four equipments. After testing has been carried out, units must ensure that the individual boxes are *resealed with wire* to denote that they are full.

Data

Case, Gas Container, Pressure Testing Apparatus, Mark I.

Dimensions	...	...	...	...	13.5 in. x 7 in. x 2.5 in.
Weight, empty	...	...	...	...	3.5 lb.
Weight, full	...	...	...	...	5 lb.

66. Provision of igniters

- (a) The provision of igniters is the responsibility of the R.A.O.C. and they are classed as ammunition.
- (b) They are provided in the form of an igniter cylinder complete with ten igniters.
- (c) The used igniter cylinder and any unspent igniters are expendable and should be discarded.

67. Provision of fuel

- (a) The provision of Flame thrower fuel (FTF) is the responsibility of the R.A.S.C.
- (b) The type of fuel to be used in the Ackpack is given in para. 15.
- (c) FTF is inflammable and rapidly deteriorates in contact with water and this must be allowed for in storage (para. 50).
- (d) The 8-gal. drum weighs approximately 80 lb. full and 70 can be carried on a standard 3-ton vehicle.

68. Spare parts

The only spare part carried in the unit is the seal elbow Part No. M1/MR6833 (para. 42 (b) and 47).

Three of these are provided in the Transit Case, No. 25 with each new equipment.



SAFETY PRECAUTIONS IN TRAINING

Section 10

RANGE LAYOUT.

69. The Ackpack firing range will cover an area not less than 100 yards x 100 yards.

70. The location should be selected; whenever possible, where the grass is short.

71. Firing will always take place with a following wind.

72. The range will consist of the following:—

- (a) Targets at ranges as indicated below.
- (b) Four firing points on all sides.
- (c) Four fuelling points at rear of one line of firing points.
- (d) Red flags to indicate firing points.
- (e) A "Blowdown" area to a flank.

73. Measurements of range layout, and personnel required are detailed as under:—

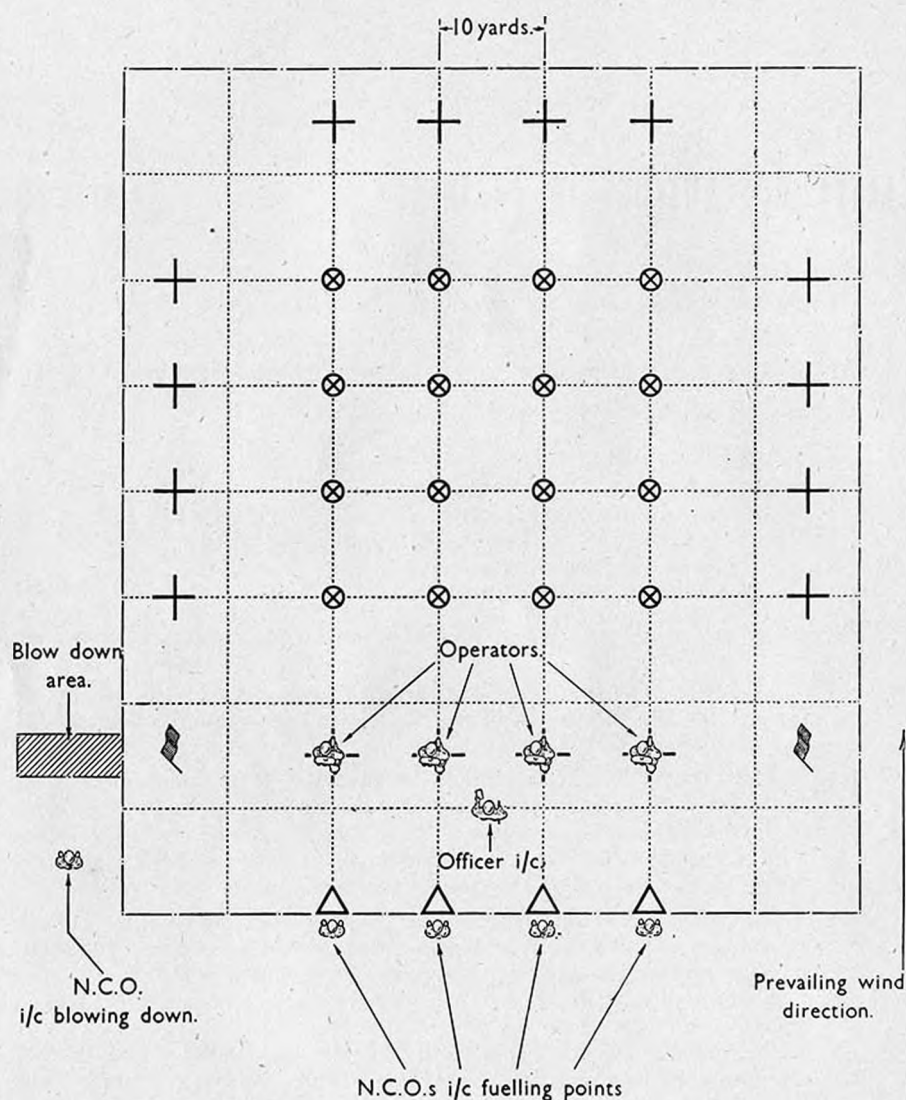
- (a) **TARGETS.** There will be four targets at ranges of 15, 25, 35 and 45 yards (see Fig. 8). 8-gal. drums sunk into the ground to a depth of 9 inches afford good targets.
- (b) **FIRING POINTS.** These should be confined to a maximum of four. When firing is in progress, one officer should be stationed at the firing points to control all operators. There will be sufficient firing points laid out around the targets to allow for firing with any wind direction. The distance between firing points will be 10 yards (see Fig. 8).
- (c) **FUELLING POINTS.** There will be four fuelling points. These should be sited to the rear of one group of firing points. Preferably the group at right angles to the prevailing wind (see Fig. 8).
(Although it is necessary to have firing points on all sides, this is not so with fuelling points.)

At each fuelling point there will be sufficient fuel and gas containers for the complete practice; empty fuel drums and gas containers will be kept apart and clearly marked. One N.C.O. is required to each fuelling point, to supervise fuelling by the operators. The fuelling points should be some 15 yards in the rear.

- (d) **RED FLAGS.** These will be placed in position before the firing (see Fig. 8). They will be to the flanks and in line with the firing points used. Once in position, the controlling officer will on no account allow any personnel past these flags, except during firing on the move (para. 76).

SUGGESTED LAY-OUT OF FIRING RANGE.

Diagram marked out in 10-yard dotted squares.



⊗ Targets.

+ Firing points.

Δ Fuelling points

Red flags

Fig. 8.

- (c) **THE BLOWDOWN AREA.** This is positioned to the right or left flank of the firing point in use, at a distance of 20 yards from the outside targets. A N.C.O. will supervise the operators when they use the area. At the completion of all firing, the controlling officer will ensure that the area is made safe by igniting any surplus fuel left on the ground.

CONTROLLED FIRING PRACTICES

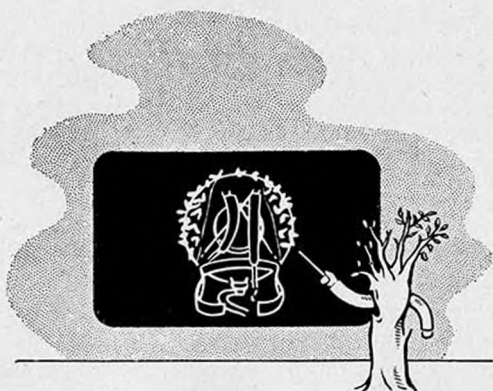
74. In order to prevent accidents, strict control is essential. The following drill should be adhered to:—

- (a) One operator at each **FUELLING POINT** will carry out the drill under supervision of a N.C.O.
 - (i) Blow down to ensure equipment free of pressure (para. 34 (a))
 - (ii) Fit a charged gas container (para. 34 (b)).
 - (iii) Fill with 4 gals. fuel (para. 34 (c)).
- (b) The operator will then put on his equipment and adjust for comfort. Check safety catch at **SAFE**.
- (c) When the N.C.O. has ensured that the operator is ready to move to the **FIRING POINT**, he will inform the officer controlling the firing practice.
- (d) At a given signal, all operators will move forward to the **FIRING POINT**, where they will be given the order "Prepare to fire". They will then:—
 - (i) Fit igniter cylinder.
 - (ii) Turn control valve adjusting cap to **ON** position.
- (e) The controlling officer, when satisfied that all the operators are ready and that the range is clear, will give the order **FIRE**, having first indicated the target to be engaged, and the number of shots to be fired.
- (f) Operators on receiving the fire orders, will:—
 - (i) Set safety catch at **FIRE**.
 - (ii) Press trigger sharply, ensuring that it moves the full length of travel.
- (g) After completion of the firing, the controlling officer will order the operators to march to the Blowdown area, where they will take up a position on the upwind side and supervised by the N.C.O., blow down (para. 34 (a)).

GENERAL

75. Gas containers when removed after firing should be returned to their individual boxes immediately.

76. When firing on the move is being practised, the controlling officer and N.C.Os. must not allow any one operator to get ahead of the others.



CAMOUFLAGE

Section 11

77. General

- The container of the Ackpack flame thrower, owing to its shape and smooth surface, reflects light. This shine often reveals the wearer's position, particularly when in movement. This enables enemy observers to single out the Ackpack carrier for special attention when he is moving forward with normally equipped troops.
- The dark colour and matt surface do much to reduce recognition of the container, but as an added precaution, use of the cover described below is advised.
- This can easily be made up locally as only normal issue face veil, garnishing coloured, and some string and cord are required. The cover is designed to stay in place when the container is not carried and to be released immediately it catches on undergrowth, etc.

78. Materials required

The materials required are as follows:—

- 1 Veil, face, normal issue, Ord. Cat. No. AA.5385.
- 15 ft. Garnishing, coloured green.
- 15 ft. Garnishing, coloured brown.
- 7 ft. approx. strong cord for draw-cord.
- 1 Small (0.75 in.) curtain or similar ring. String for tying garnish to net.

79. To make up the net

- Cut the veil as shown in Fig. 9.
- Cut the garnish into strips 1 in. wide by 6 in. long, to make 60 green and 60 brown strips.
- Fix each strip firmly to net by tying at centre with a short length of string, with a reef knot.
Mix brown and green colours evenly.
- Thread draw cord through net as shown in Fig. 9. At right side cord is tied to net and to small ring. Left side cord runs free and is sufficiently long for loop to engage on hook on frame as shown in Fig. 10. Nine inches of cord extends beyond loop for quick release as in Fig. 11.

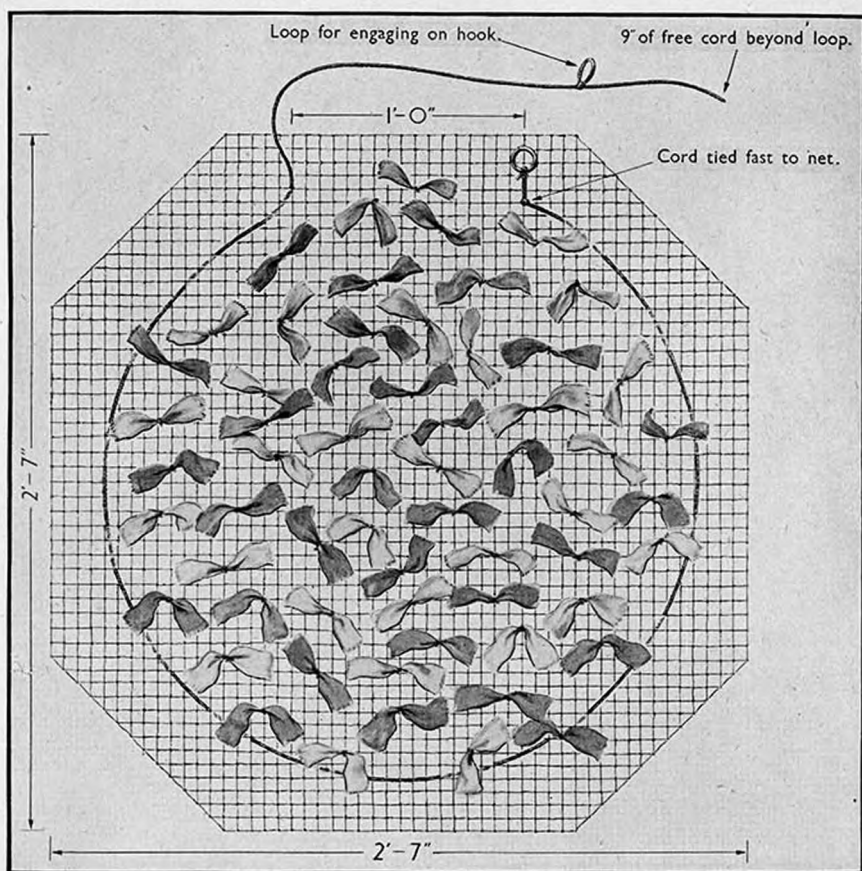


Fig. 9. Pattern of camouflage net

80. To fix net on fuel container

- Place pack face downwards on ground over net, with free cords at top.
- Ease net round fuel container starting at the bottom, and pull tight with draw cord.
- Pass cord over lugs at top of fuel container and through ring.
- Fixed loop in cord should now slip over hook on container frame, this loop will require adjusting. Net should now remain in position on pack.

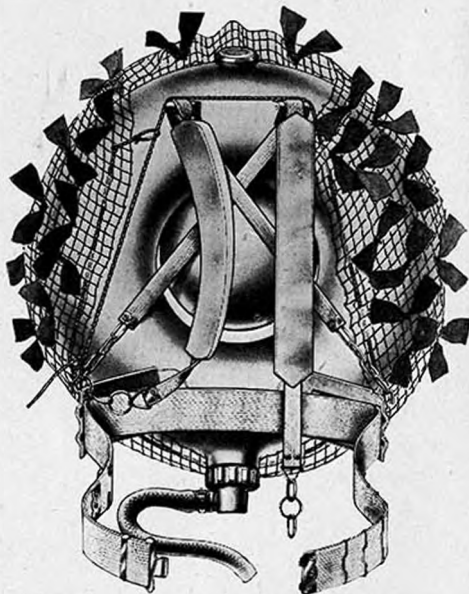


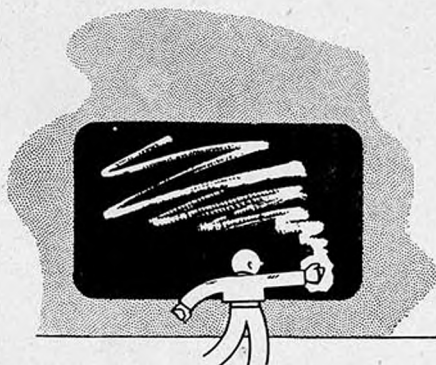
Fig. 10. Camouflage net in position



Fig. 11. Camouflage net in position showing quick release device

81. Quick release device

If net catches on undergrowth pull 9 in. extension of cord down to release loop from hook, and net will automatically pull away.



NOTES

NOTES

RESTRICTED

The information given in this document is not to be communicated either directly or indirectly, to the Press or to any person not authorized to receive it.

W.O.
Code No.
1675-1

User Handbook
FLAME THROWER, PORTABLE No. 5, Mark I
Land Service
1947

AMENDMENTS (No. 1)

- I. Page 5. Para. 18(b) (iii). Add at end :

Amdt. 1/May/1947.

A filter (Fig. 2A) is fitted in the elbow to prevent foreign matter from the fuel container entering the projector.

Insert new Fig. 2A.

Amdt. 1/May/1947.

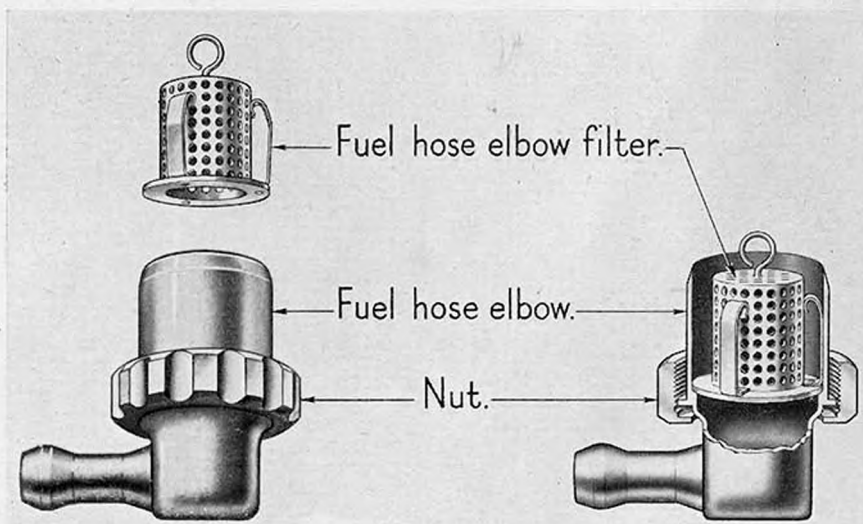


Fig. 2A

2. Page 11. Para. 34 (c) (ii), item 5. Before "Replace fuel elbow", etc. insert:
Amdt. 1/May/1947.

Withdraw the filter and ensure that it is clean, and replace it, taking care not to damage the sharp edge of the elbow.

3. Page 13. Para. 43. Insert new sub-paragraph:
Amdt. 1/May/1947.

(d) Seals are to be treated and stored in lanoline.
They will be exchanged annually.

- Para. 45 (b). Add new sub-paragraph:
Amdt. 1/May/1947.
(iii) Filter clean and not damaged.

4. Page 20. Delete lines 1 to 4 from bottom of page and insert:
Amdt. 1/May/1947.

The only spare parts carried in the unit are the seals elbow, Part No. M1/ MR 6833 (paras. 43 (b), 43 (d) and 47).

Three of these are provided and are stored in a Container, sealing ring, No. 5, Mark I (Part No. 4380) which is carried in the Transit case, No. 25.

THE WAR OFFICE,
31st May, 1947.

By Command of the Army Council,

Eric B. B. Ford.

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W.O.
CODE No.
1675-2

User Handbook
FLAME THROWER, PORTABLE, No. 5, Mark I
Land Service
1947

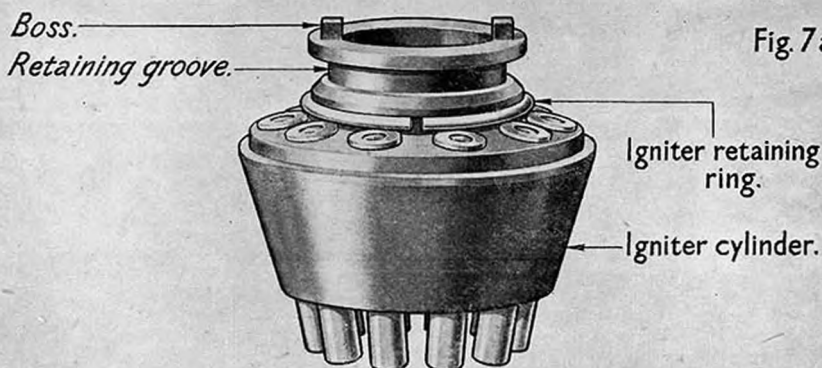
AMENDMENTS (No. 2)

1. Page 20. *Delete Para 66 and substitute:—*

Amdt. 2/Oct./1947

66. Method for re-loading and inspection (Fig. 7a).

- (a) The igniter retaining ring on the cylinder should be prized up gently with a small screwdriver, and the burnt-out cartridges then pulled out with a pair of pliers.
- (b) The cylinders should then be cleaned to remove superficial fouling and pulled through with a pistol push rod.
- (c) The cylinders should be slightly oiled when kept in store, but should be dried before re-loading for firing.
- (d) Special care should be taken to ensure that the two bosses on the inner end of the igniter cylinder are not damaged.
- (e) See that the new cartridges slip into the cylinder easily and are retained securely by the spring retaining ring.
- (f) The cylinders should be examined for any cracks in the metal, and the retaining groove of the cylinder should be undamaged.



By Command of the Army Council,

Eric B. B. Hurd.

THE WAR OFFICE,
3rd October, 1947